

Lower White River Watershed Restoration Action Strategy

Part II: Concerns and Recommendations

Prepared by

Indiana Department of
Environmental Management
Office of Water Quality

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Foreword

The First Draft (January 2000) of the Watershed Restoration Action Strategy (WRAS) was reviewed internally by IDEM and revised accordingly. The Second Draft (Spring 2000) was reviewed by stakeholders and revised accordingly. This Third Draft (January 2001) is intended to be a living document to assist restoration and protection efforts of stakeholders in their sub-watersheds. As a "living document" information contained within the WRAS will need to be revised and updated periodically.

The WRAS is divided into two parts: Part I, Characterization and Responsibilities and Part II, Concerns and Recommendations.

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Lower White River Watershed Restoration Action Strategy

Part II: Concerns and Recommendations

Part II of the Watershed Restoration Action Strategy discusses the water quality concerns identified for the Lower White River watershed and lists recommended management strategies to address these concerns.

Part II includes:

Section 1	Water Quality Concerns and Priority Issues Identified by Stakeholder Groups
Section 2	Water Quality Concerns and Priority Issues Identified by State and Federal Agencies
Section 3	Identification of Impaired Waters
Section 4	Priority Issues and Recommended Management Strategies
Section 5	Future Actions and Expectations

1 Water Quality Concerns and Priority Issues Identified by Stakeholder Groups

The Lower White watershed contains potential stakeholder groups that have different missions. Many of these groups have a long history of working in the Lower White watershed. The following discussion briefly describes some of the watershed groups and lists their priorities and concerns.

Local Soil & Water Conservation Districts

At the beginning of 1997, the local Soil & Water Conservation Districts in every county in Indiana convened meetings of local stakeholders as a part of their locally led conservation program. The purpose of these meetings was to get public input on natural resource concerns within each county and to lay the groundwork for resource protection. The resource concerns relative to water quality, identified by some of the SWCDs within the watershed, are listed below.

Brown County:

Brown County identified the following concerns:

- ◆ Water quality
- ◆ Erosion
- ◆ Bacteria problems from bad septic systems
- ◆ Urban development

Daviess County:

Daviess County identified ten broad concern categories, then identified specific concerns within the broad category. Only the categories and specific concerns that are associated with water quality are listed below.

1. Cropland

- Well water quality
- I-69
- Ground water quality
- Soil and water erosion
- Drainage
- Filter strips on ditch banks 10-20 ft.
- Residential flight to rural areas
- Utilization and stock piling of turkey manure
- Decrease in soil quality because of over application of manure
- Over application of chemicals and nutrients
- Maintenance of existing conservation structures
- Zoning

2. Livestock concentration

- Well water quality
- Ground water quality
- Filter strips on ditch banks 10-20 ft.
- Utilization and stock piling of turkey manure
- Decrease in soil quality because of over application of manure
- Cattle/ livestock in streams/ creeks
- Runoff from feedlots
- Nutrient management improvement needed
- Zoning

3. Education

- Understand both sides of the resource concerns
- Over application of chemicals and nutrients
- Pesticide management need for better education
- Soil suitability for septic systems
- Over application to yards and gardens by homeowners
- Zoning

4. River and stream management

- Concentration of livestock
- Well water quality
- Ground water quality
- Soil and water erosion
- Drainage (water management)
- Riverbank erosion
- Increase of flooding in the White River bottoms due to urban construction in northern Indiana
- Unclaimed strip mine ground
- Cattle/livestock in streams/creeks
- Fish quality and quantity in White River
- Loss of woodlands
- Runoff from feedlots
- Filter or buffer strips needed along streams
- Zoning

5. Pastureland

- Well water quality

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- Ground water quality
- Soil and water erosion
- Unclaimed strip mined ground
- Cattle/livestock in streams/creeks
- Zoning

6. Rural development

- Loss of prime farmland to urban sprawl
- Well water quality
- I-69
- Septic tanks causing pollution
- Soil suitability for septic systems
- Over application to yards and gardens by homeowners
- Loss of woodlands
- Roadside erosion caused by undercutting banks from road ditch
- Zoning

7. Other environmental concerns

- Well water quality
- I-69
- Ground water quality
- Soil and water erosion
- Supply clean and potable water
- Septic tanks causing pollution
- Soil suitability for septic systems
- Unclaimed strip mined ground
- Zoning

8. Industrial concerns

- Increase of coal land, problems with reclaiming
- I-69
- Zoning

Greene County:

Greene County identified five local concerns in a narrative format as follows:

- There is a need for financial assistance to aid farmers in the application of conservation practices.
- Protect farmland and the rural lifestyle for future generations.
- Need to maintain existing drainage systems: legal, private, and county road.
- Educate urban and rural communities on the importance of farming and soil and water conservation
- Soil erosion and water quality: surface and ground water

Knox County:

The local concerns identified by Knox County were:

- Water quality and quantity
- Comprehensive land use planning

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- Soil erosion on cropland
- Waste management
- Financial assistance
- Air quality
- County wide drainage

Monroe County:

The top five local concerns from Monroe County are:

- Water quality (surface & ground) for drinking & recreation
- Soil erosion (urban & rural)
 - Need for erosion control on timber harvest
 - Need for erosion control at limestone quarries
 - Need for erosion standards on developing land
- Education on natural resources interrelationships
- Need for financial assistance (to landowners for conservation practices)
- Need for technical assistance (to landowners for conservation practices)

Owen County:

The main concerns associated with water quality in Owen County were identified as 1.) Sedimentation from soil erosion, 2.) Streambank erosion from flooding, and 3.) Waste disposal. These main concerns came from a listing of 30 identified resource concerns which included:

- ◆ Soil erosion
- ◆ Gullies
- ◆ Water retention in the uplands
- ◆ Need for surface water management
- ◆ Increase number of ponds and lakes
- ◆ Loss of productive farmland and forest
- ◆ Development in floodplains
- ◆ Sedimentation from developments
- ◆ Waste disposal (human and animal)
- ◆ Improper septic systems installed
- ◆ Dead animals
- ◆ Planning for development
- ◆ Groundwater
- ◆ Coal mines/ Quarries
- ◆ Need enforcement of the rules
- ◆ Dust, mud, erosion, sulfur
- ◆ Damage to ponds, wells and springs from blasting
- ◆ Surface water quality
- ◆ Nutrient loading

2 Water Quality Concerns and Priority Issues Identified by State and Federal Agencies

This section presents the combined efforts of state and federal agencies, and universities, such as IDEM, IDNR, USDA-Natural Resources Conservation Service, Ohio River Valley Water Sanitation Commission, Purdue University, Indiana University, Indiana Geologic Survey, and US Geological Survey, to assess water quality concerns and priority issues in the Lower White Watershed. This multi-organization effort formed the basis of the Unified Watershed Assessment for Indiana.

Indiana's Unified Watershed Assessment (UWA)

The UWA workgroup gathered a wide range of water quality data that could be used to characterize Indiana's water resources. These data were used in 'layers' in order to sort the 8-digit HUC watersheds according to the present condition of the water in lakes, rivers, and streams. The workgroup used only those data, which concerned the water column, organisms living in the water, or the suitability of the water for supporting aquatic ecosystems. Each 'layer' of information/data was partitioned by percentiles into scores. The scores ranged between 1 and 5, with a score of 1 indicative of good water quality or minimum impairment, and a score of 5 indicating heavily impacted or degraded water quality. The scoring derived through the UWA process is presented in Table 2-1.

The data layers listed in Table 2-1 can be defined as:

- ◆ Lake Fishery: Large mouth bass community information for lakes
- ◆ Stream Fishery: Small mouth bass community information for streams
- ◆ Aquatic Life Use Support: The 'livability' of the water column for aquatic life, determined from evaluation of chemical and physical water data, and assessment of aquatic life
- ◆ Fish Consumption Advisories: Site specific advisories based on current data
- ◆ Fish Index of Biotic Integrity: Based on fish community diversity and fish health
- ◆ Qualitative Habitat Evaluation Index: Measure of whether the aquatic habitat is suitable for diverse communities, based on visual observations
- ◆ Lake Trophic Scores: Indicator for the rate at which a lake is 'aging' due to inputs of nutrients and other factors
- ◆ Sediment Potential: Indicator of potential sediment input to waterbodies in the watershed

The sources and additional information for these data layers include:

- ◆ Lake Fishery: From IDNR fisheries surveys of lakes and reservoirs from 1972 to 1994. Raw scores were averaged for all lakes in the watershed.
- ◆ Stream Fishery: From IDNR fisheries surveys of streams from 1970 to 1994. Raw scores were averaged for all streams in the watershed.
- ◆ Aquatic Life Use Support: IDEM, Office of Water Quality, Assessment Branch
- ◆ Fish Consumption Advisories: ISDH and IDEM, Office of Water Quality, Assessment Branch
- ◆ Fish Index of Biotic Integrity: IDEM, Office of Water Quality, Assessment Branch
- ◆ Qualitative Habitat Evaluation Index: IDEM, Office of Water Quality, Assessment Branch
- ◆ Lake Trophic Scores: Indiana Clean Lakes Program through IDEM, Office of Water Quality, Assessment Branch. This score was based on information gathered from sampling conducted in the 1970's and 1980's.
- ◆ Sediment Potential: U.S. Geological Survey scored the population rate of change and the 1996 Conservation Tillage Transect data. The scores were then added and normalized to produce a sediment yield indicator for each watershed.

From this scoring, it is evident that sediment potential, fish consumption advisories, fish index of biotic integrity, and stream fishery on the Lower White are key areas of concern. Lake fishery, aquatic life support, and lake trophic scores are secondary concerns within the Lower White watershed.

TABLE 2-1
RESULTS OF THE UNIFIED WATERSHED ASSESSMENT
FOR LOWER WHITE

Data/Information Layer	Lower White (05120202) Score
Lake Fishery	NA
Stream Fishery	3
Aquatic Life Use Support	3
Fish Consumption Advisories	3
Fish Index of Biotic Integrity	4
Qualitative Habitat Evaluation Index	1
Lake Trophic Scores	2
Sediment Potential	5

Note:

The UWA scores range from 1 to 5, with a score of 1 indicating good water quality and a score of 5 indicating severe impairment.
NA= Not Available

Indiana's 2000-2001 Unified Watershed Assessment (UWA)

During summer 1999 the UWA workgroup used additional layers of information to identify the **resource concerns and stressors** for each of the 361 11-digit watersheds in Indiana. Examination of the human activities that have the potential to impact the ecosystem will help planners to focus on those areas where restoration may be most critical. Organizations can identify opportunities to use their programs and resources to address those areas.

This focusing process will illuminate areas where the interests of two or more partner agencies may converge. It is intended that this will lead to more effective allocation of resources for restoration and protection activities. At the local level, this information can assist groups to prioritize watershed activities and provide some discussion points for planning.

This amended assessment has the following benefits:

- ◆ Provides a logical process for targeting funds, which may be expanded or updated without changing the basic framework.
- ◆ Provides information at a finer resolution (11-digit hydrologic units) to agencies and local groups interested in watershed assessment.
- ◆ Identifies data gaps.
- ◆ Can be used as a compliment to other assessments, such as the 305(b) Report and 303(d) List.

Table 2-2 and Figure 2-1 show the results of the 2000-2001 UWA for the Lower White watershed.

3 Identification of Impaired Waters

Section 303(d) of the Clean Water Act requires states to identify waters that do not or are not expected to meet applicable water quality standards with federal technology based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Indiana's 303(d) list was approved by EPA on February 16, 1999.

Once the Section 303(d) list and ranking of waters is completed, the states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with the water quality standards. The TMDL is an allocation that determines the point and nonpoint source (plus margin of safety) load reductions required in order for the waterbody to meet water quality standards. IDEM's Office of Water Quality has and continues to perform point source waste load allocations for receiving waters. Part I of the WRAS briefly outlines IDEM's strategy for developing TMDLs.

The following Lower White watershed waterbodies are on Indiana's 1998 Clean Water Act Section 303(d) list submitted to and approved by EPA (Figure 3-1):

Beanblossom Creek for E. coli violations

East Fork Fish Creek for impaired biotic communities

First Creek for E. coli violations

Jacks Defeat Creek for impaired biotic communities

Kessinger Ditch for E. coli violations

Lake Lemon for PCB fish consumption advisory

McCormick's Creek for impaired biotic communities

Plummer Creek for E. coli violations

Prairie Creek North and South Forks for E. coli violations

Richland Creek for impaired biotic communities, E. coli violations, and mercury and PCB fish consumption advisories

South Fork Griffy Creek for impaired biotic communities

West Fork White River for impaired biotic communities, E. coli violations, cyanide, and mercury, PCB, and lead fish consumption advisories

4 Priority Issues and Recommended Management Strategies

Part I provided the existing water quality information for the Lower White watershed and Part II lists priority issues and concerns from local, state, and federal stakeholders in the watershed. This section pulls together the priority issues and concerns held by all stakeholders and recommends management strategies. Underlying all discussions of priority issues and concerns is the fact that improving water quality in the Lower White Watershed will also enhance the natural and recreational values of Lower White. Each subsection below focuses on a single priority issue.

4.1 Data/ Information and Targeting

Local stakeholders did not identify the need for additional data or information. However, the success in restoring water quality in the Lower White watershed is fundamentally based on identifying the

specific geographic problem areas; identifying all sources contributing to the impairment of the waterbody; and quantifying the contribution of a pollutant by each source.

Recommended Management Strategy 1: Review existing data and assessments to help determine which geographic areas to target and prioritize. The scale at which targeting and prioritization should occur is the 14-digit HUC watershed area (Figure 2-2 of Part I). Targeting and prioritization will require input from stakeholders living in those geographic areas. The purpose of prioritization and targeting is to enhance allocation of resources in the effort of improving water quality. Data and assessments from the 1996 sampling performed by the Office of Water Quality is complete and is included in the 1998 305(b) report (Appendix B of Part I). This information was used in writing this Watershed Restoration Action Strategy, and will provide guidance in the future in order to better prioritize and target specific areas in the Lower White watershed.

Recommended Management Strategy 2: Develop Total Maximum Daily Loads (TMDLs) for all impaired waterbodies in the watershed. Through the development of TMDLs, all sources contributing to the impairment of a waterbody will be identified and quantified in terms of their contribution to the waterbody. This includes gathering more data and information on nonpoint sources of water pollution. Throughout the TMDL process, information and feedback from watershed stakeholders will be required in order to generate appropriate allocation scenarios. The result of developing TMDLs will be an understanding of the impact of nonpoint sources on water quality in the watershed.

4.2 Streambank Erosion and Stabilization

Cutting and erosion of streambanks was identified by many local stakeholders as a major concern. This cutting and erosion increases the sediment load in waterbodies and directly impacts the scenic and recreational values of waterbodies in the Lower White watershed. Streambank cutting and erosion is often a function of many factors that include stream energy and velocity, flooding, and land management. Increased drainage in headwater streams and ditches increases stream energies during rainfall events and often leads to increased streambank cutting and erosion downstream. Land clearing and urban development also impact volume and velocity of runoff. Hence, this problem is not easily solved.

Recommended Management Strategy 1: IDEM's Office of Water Quality offers their active support to the primary agency that has jurisdiction over this problem in order to facilitate the development of solutions.

Recommended Management Strategy 2: Structural stabilization of specific streambank areas in the Lower White watershed may solve problems on a temporary basis. However, a comprehensive understanding of drainage, stream flows and energies, and land management practices is required to adequately approach this problem. Conservation partners (local, state, and federal) are actively working within their specific geographic areas (typically at the county level); however, this may not facilitate solving the streambank cutting and erosion problems because efforts may not be coordinated between headwater and downstream areas. For example, work in the Upper White River watershed to increase drainage should take into account the work and efforts of downstream partners to reduce flooding and streambank cutting. Conservation efforts should be in the context of watersheds and span county boundaries in order to account for downstream impacts. Local Drainage Boards, Planning and Zoning Boards, and County Commissioners could effectively address this issue by involving local stakeholders in the decision making process and approaching the issue on a watershed basis.

4.3 Failing Septic Systems and Straight Pipe Discharges

Several local stakeholders have identified failing septic systems and straight pipe discharge from septic tanks as significant sources of water pollution in the Lower White watershed. Straight pipe discharges from septic tanks and septic tanks connected to drainage tiles are illegal (327 IAC 5-1-1.5); however, these practices still exist in the Lower White watershed.

Recommended Management Strategy 1: Adequately characterize the direct impact of communities discharging their septic tank effluent to waterbodies. The option of choice to eliminate the illegal discharges will be a cooperative effort between homeowners and local, state, and federal stakeholders. This will involve coordination between the Office of Water Quality, local health departments, Indiana State Department of Health, and other stakeholders. During generation of the Clean Water Act Section 303(d) list for 2000 and completion of subsequent TMDLs, illegal straight pipe discharges will be targeted for characterization and elimination.

Recommended Management Strategy 2: Adopt or strengthen local planning, zoning, and health ordinances to address this problem during new development. Existing local ordinances could be enforced more vigorously to correct problems with existing systems. Implementation will require input from local stakeholders.

Recommended Management Strategy 3: An education/ outreach program on the health and environmental risks of septic system discharges, system maintenance, and system function would provide homeowners and others with basic information to better understand the impacts of inadequate systems. This kind of education effort would involve local health departments, Indiana State Department of Health, IDEM, and other stakeholders.

4.4 Water Quality - General

The Clean Water Act Section 303(d) list presented in Section 3 lists impaired waterbodies for the Lower White watershed. This list will be revised in 2000.

Recommended Management Strategy 1: Develop and implement watershed management plans, which address all point source and nonpoint source water quality concerns identified by local stakeholders. These plans can also be used to address impairments identified by the 303(d) list. Watershed management plans should be completed at a 14-digit hydrologic unit scale to be manageable and effective. IDEM's Watershed Management Section can provide planning guidance and assistance through the NRCS Watershed Conservationists working directly with IDEM.

Recommended Management Strategy 2: The Clean Water Act requires states to complete TMDLs for waterbodies listed on the Section 303(d) list. The Office of Water Quality is currently evaluating and exploring the modeling process and data needs required to complete TMDLs for the Section 303(d) listed waterbodies. Completion of a TMDL will involve loading allocations of a pollutant to both point and nonpoint sources. The Office of Water Quality is currently drafting a TMDL strategy that involves stakeholder input throughout the process. The TMDL development process is currently scheduled to occur from 2001 through 2008 for waterbodies in the Lower White watershed. The development of TMDLs will involve meetings with stakeholder groups linked to the Section 303(d) waterbodies. As TMDLs are developed, this Watershed Restoration Action Strategy will be amended to incorporate the final TMDLs.

4.5 Fish Consumption Advisories

As noted in Part I and Part II, fish consumption advisories are concerns within the Lower White watershed. Three of the twelve 303(d) listed waterbodies in the Lower White watershed include fish consumption advisories.

Recommended Management Strategy 1: The three fish consumption advisories are for PCB contamination. Two also include mercury contamination and one of those includes lead contamination. The source of the contamination is unknown and may be from atmospheric deposition or some unknown discharge. To address this concern, the cause or source must be identified. Until that is accomplished, the fish consumption advisories should be followed.

4.6 Nonpoint Source Pollution - General

Nonpoint source pollution contributions are often difficult to assess or quantify. They can include sediment deposition from soil erosion, nutrient runoff from animal wastes and commercial fertilizer, herbicide and insecticide runoff, and oil or fuel waste runoff. Nonpoint pollution can emanate from agricultural as well as urban lands. Currently, loads of nonpoint source pollutants to water are often inferred by examination of land use practices, without actual measurements. In addition, the actual water quality impairments related to nonpoint source pollutants have not been well characterized in the Lower White watershed. Finally, very few regulatory control mechanisms exist to control nonpoint source pollution.

Recommended Management Strategy 1: Through the TMDL development process, the Office of Water Quality will identify, assess, and quantify nonpoint source pollutant loads to impaired waterbodies. In order to accomplish this task, the Office of Water Quality will work closely with local, state, and federal stakeholders at the watershed and sub-watershed level. Loading scenarios for nonpoint source pollutants will be developed by the Office of Water Quality and reviewed by local, state, and federal stakeholders. Implementation of nonpoint source controls will involve a blend of funding assistance and regulatory action, where applicable.

Recommended Management Strategy 2: Seek out the various funding sources that could be used to implement management practices that reduce nonpoint source pollution. Numerous funding mechanisms such as, but not limited to, the Conservation Reserve Program, Environmental Quality Incentive Program, Lake and River Enhancement program, and Section 319(h) grants, exist to promote practices to reduce nonpoint source pollution in the watershed. Many private source grants are available for wildlife and conservation areas. To more efficiently and effectively address nonpoint source pollution in the watershed, the prioritization and targeting discussed previously in Part II should be used to allocate further application of resources.

Recommended Management Strategy 3: Implement more stringent urban site design requirements to reduce nonpoint source contaminants. The management of urban nonpoint sources can be addressed through effective land use planning and site design. Designs that incorporate less impervious area and more natural infiltration areas have proven effective in reducing urban nonpoint pollution. Local stakeholders working with local planning and zoning authorities, and developers, would implement this strategy.

Nonpoint Source Pollution- Animal Wastes and Nutrient Management

Nonpoint source pollution as a result of improper management or over application of animal waste products and commercial fertilizers is a major concern within the watershed. This concern is not limited to large livestock producers. It involves both agricultural producers and rural/ urban homeowners who use fertilizers or keep any livestock. Under the "Draft" Confined Feeding Rules currently proposed by IDEM's Office of Land Quality, livestock producers that meet the definition of confined feeding operations will be required to address effective methods of manure storage and application. The "Draft" rules require manure management plans, which will address manure application at agronomic rates not to exceed 150 pounds per acre of nitrogen application. Additionally, under U.S. Environmental Protection Agency rules, large concentrated animal feeding operations are subject to National Pollution Discharge Elimination System permitting requirements.

Recommended Management Strategy 1: Provide information and assistance to livestock producers to help them understand the importance of proper manure management and to meet the requirements of the new rules. Local stakeholders can take a leadership role in the education and information aspect of this strategy by sponsoring tours, field days, and training sessions.

Recommended Management Strategy 2: Educate rural and urban homeowners on the water quality impacts of over application of lawn and garden fertilizers. This could be accomplished through local media, field days and training sessions sponsored by local stakeholders.

Nonpoint Source Pollution- Lack of riparian corridors/ filter strips

The lack of riparian habitat and corridors along stream channels allows pollutants unrestricted flow into waterbodies. Sediments, pesticides, and nutrients will settle out of flow when there is an adequate time delay through grasses, shrubs, and trees, which are components of desirable riparian corridors. These corridors serve as buffers to agricultural and urban influences, provide wildlife habitat, affect flood flows, stabilize channel banks, and provide shading of the channel which reduces water temperature.

Recommended Management Strategy: To effectively address lack of riparian areas/ filter strips within the watershed, prioritization and targeting must be used to identify areas for improvement and to allocate financial resources. Several programs, such as the Conservation Reserve Program, Environmental Quality Incentive Program, Lake and River Enhancement, and Section 319(h) grants can be used in combination to address riparian zones and filter strips.

Nonpoint Source Pollution- Education and Outreach

This Watershed Restoration Action Strategy is a beginning point for education and outreach efforts. It compiles existing knowledge about the water resource in this watershed and presents it to the stakeholders who live in the Lower White. It brings to a public forum the available information and local concerns. However, the education process does not stop with the publication of this document.

Recommended Management Strategy: Local stakeholders, in cooperation with state and federal agencies, need to seek additional information on water quality concerns and issues addressed in this document and make that information available to the public. Additionally, the problems associated with septic failures, soil erosion, land use issues, animal waste management, pest management, nutrient management, and riparian zones can be emphasized through meetings, training sessions, and stakeholder group discussions. Field days are excellent ways to present information and encourage discussion. Use of experts with strong background knowledge coupled with local sponsors is an effective method to convey solutions to these problems.

4.7 Point Sources - General

There are 85 NPDES permitted dischargers, and six CSO discharge points in the Lower White watershed. Additionally there are illegal point source discharges, such as tiles discharging septic tank effluent that exist in the watershed.

Recommended Management Strategy: Identify and correct illegal point sources and non-complying point sources. The Permitting and Compliance Branch of the Office of Water Quality is responsible for issuing NPDES permits and monitoring compliance of NPDES permit holders. Clearly, more emphasis and resources are needed to identify and correct illegal point sources and non-complying point sources. Improving compliance of NPDES dischargers and identifying illegal dischargers will involve fostering a working relationship with other local, state, and federal stakeholders to monitor compliance and report unusual discharges or stream appearance. In regards to illegal discharges, the Office of Water Quality will work with local, state, and federal stakeholders to identify and eliminate these sources of water pollution.

5 Future Expectations and Actions

As discussed in Part I, this Watershed Restoration Action Strategy is intended to be fluid document that will be revised or amended as new information becomes available. Section 5.1 discusses expectations derived from the Strategy and how progress will be measured. Specific revisions and amendments to the Watershed Restoration Action Strategy are discussed in Section 5.2. Finally, the Watershed Restoration Action Strategy will be reviewed by all stakeholders before it becomes final, as described in Section 5.3.

5.1 Expectations and Measuring Progress

The Lower White Strategy provides a starting point to address water quality concerns held by local, state, and federal stakeholders. Part II provides recommended management strategies to address these concerns. Through cooperative efforts with stakeholders, all of the recommended management strategies listed will begin implementation by the summer of 2000.

Measurement of progress is critical to the success of any plan. Water quality improvements will not take place overnight. Measuring of progress in terms of water quality will be provided through the Office of Water Quality Assessment Branch's rotating basin monitoring strategy. Specifically, they will be conducting sampling again in the Lower White River basin in the year 2001. This will allow an assessment of progress in improving water quality.

5.2 Expected Revisions and Amendments

This Watershed Restoration Action Strategy is intended to provide a starting point to improve water quality and measure the improvement. Hence, this document will require revisions and amendments as new information becomes available. The future revisions and amendments have been divided into those that are expected within the next year (Section 5.2.1) and those that will occur over a long-term basis (Section 5.2.2).

5.2.1 Short Term Revisions and Amendments

The most significant revisions and amendments will likely occur during 2001 and after, as a result of the rotating basin assessments to be completed during 2001. The Section 305(b) assessments will be completed by late 1999 or early 2000. Local, state, and federal stakeholder comments regarding the Watershed Restoration Action Strategy will be addressed in future revisions of the document.

5.2.2 Long Term Revisions and Amendments

The Office of Water Quality is moving toward adopting a watershed management approach to solve water quality problems. Part of the watershed approach is the use of a rotating basin management cycle. The Assessment Branch of the Office of Water Quality has already adopted this rotating basin cycle in its intensive monitoring and assessment of Indiana waterbodies (this is in addition to the already established fixed monitoring station monitoring which occurs on a monthly basis). Based on the cycle the Assessment Branch is using, the next intensive monitoring of the Lower White watershed will occur during the sampling season of 2001. The information from the 2001 monitoring effort will be incorporated into the Watershed Restoration Action Strategy.

In addition, the Watershed Restoration Action Strategy may be revised or amended prior to 2001, if sufficient information becomes available.

5.3 Review of the Watershed Restoration Action Strategy

Before this Watershed Restoration Action Strategy becomes final, it will undergo rigorous review. The first stage of review will be performed internally by the Office of Water Quality. Once the Watershed Restoration Action Strategy has been revised to address internal Office of Water Quality comments, it will be circulated to local, state, and federal stakeholders in the watershed and meetings within the watershed will be held to discuss the document. Written comments from local, state, and federal stakeholders will be addressed and the Watershed Restoration Action Strategy will again be revised to incorporate applicable comments. Once internal and external comments have been addressed, the final version of the Watershed Restoration Action Strategy will be released.

Table 2-2

HYDROLOGIC UNIT SCORES for Each Parameter Used in the Unified Watershed Assessment [2000-2001]																
11 Digit Hydrologic Unit		Mussel Diversity and Occurrence	Aquatic Life Use Support	Recreational Use Attainment	Stream Fishery	Lake Fishery	Eurasian Milfoil Infestation Status	Lake Trophic Status	Critical Biodiversity Resource	Aquifer Vulnerability	Population Using Surface Water for Drinking Water	Residential Septic System Density	Degree of Urbanization	Density of Livestock	% Cropland	Mineral Extraction Activities
Lower White	05120202010	nd	1	5	nd	nd	nd	2	4	4	3	4	2	2	1	1
	05120202020	1	3	1	nd	nd	nd	2	4	3	3	3	1	3	1	2
	05120202030	nd	1	1	nd	nd	nd	nd	2	3	3	2	2	5	2	4
	05120202040	1	3	3	5	nd	nd	nd	4	3	3	3	2	5	2	2
	05120202050	1	3	4	nd	nd	nd	1	3	2	3	1	2	5	3	3
	05120202060	nd	2	nd	nd	nd	nd	2	2	3	3	2	2	4	2	5
	05120202070	1	3	4	nd	nd	nd	2	2	3	3	1	2	4	5	4
	05120202080	nd	2	5	nd	nd	nd	nd	4	2	3	1	2	5	4	4
	05120202090	1	1	1	nd	nd	nd	3	3	3	3	2	2	5	5	3
	05120202100	3	3	1	nd	nd	nd	nd	4	3	1	2	2	3	4	4

Note:

The UWA scores range from 1 to 5, with a score of 1 indicating good water quality and a score of 5 indicating severe impairment.

Nd= No data

Figure 2-1

Lower White & Eel (White) Watersheds

